

Effect of floor type on productive, carcass and meat quality traits of growing rabbits

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ABSTRACT: The aim of the experiment was to compare the production, carcass and meat quality traits of growing rabbits (maternal line) housed on different floor types. At the age of 35 days, the rabbits (n=126) were randomly sorted to 3 groups and were housed in pens with a basic area of 1.27 m². The floor type of the different pens was plastic mesh (PM), deep litter (DL) or wire mesh (WM). Body weight, feed intake, mortality, carcass and its parts, pH and colour of meat were measured. The 7 and 10 week-old PM and WM rabbits' body weight was significantly higher compared to the DL group. At the age of 11 weeks significant differences were only found between the PM and DL groups. Twelve week-old rabbits showed no significant differences among the groups. No significant differences were found for mortality, feed consumption and feed conversion ratio. Significant differences were recorded between the PM and DL groups for the average daily gain, dressing out percentage, b* value and ratio of the hind part related to the reference carcass. It could be concluded that housing the growing rabbits on wire or plastic mesh floors had no substantial differences, while housing rabbits on deep litter negatively affected certain traits, but the alterations were smaller compared to the results of the relevant literature.

Key words: Floor type, Carcass traits, Productive traits, Growing rabbit.

INTRODUCTION – From the aspect of animal welfare, the floor is one of the most important technological elements, as the animals spend most of their time contacting the floor. Some organic production systems (BioAustria, BioSuisse, Naturland) suggest rearing rabbits on deep litter (at least 50% of the floor) to offer animals a more comfortable floor (Szendrő and Dalle Zotte, 2011). According to Morrise *et al.* (1999), the final body weight of rabbits housed in deep litter was 8% smaller compared to rabbits housed in wire mesh. Another source of problem is that the rabbits may consume from the spoiled litter material that may cause increased mortality (Lambertini *et al.*, 2001; Dal Bosco *et al.*, 2002). Princz *et al.* (2009) and Dalle Zotte *et al.* (2009) found no effect among the production and slaughter performance of rabbits housed on plastic or wire mesh floor. In this experiment, the live performances as well as carcass and meat quality traits of growing rabbits were examined depending on the floor types (plastic mesh, wire mesh and deep litter).

MATERIAL AND METHODS – The experiment was performed at Kaposvár University using the maternal line of the Pannon breeding program (n=126). At the age

of 35 days, the rabbits were randomly sorted to 3 groups and housed in pens with a basic area of 1.27 m². The floor type of pens was plastic mesh (PM), deep litter (DL) or wire mesh (WM). Daily lighting period was 16 h and the temperature ranged between 15-18°C. The rabbits were fed a commercial pellet *ad libitum* (5-9 wk: medicated pellet; 9-12 wk: non medicated pellet). Water was available *ad libitum* from nipple drinkers. Deep litter was replaced weekly and fresh straw was placed to the deep-litter daily. Body weight and feed consumption were measured every week and weight gains and feed conversion values were calculated. Mortality was recorded every day. The rabbits were slaughtered between the ages of 84 and 86 days. The slaughter dissection procedures were performed according to the WRSA recommendation (Blasco and Ouhayoun, 1996). The pHu and color of meat were measured with Testo 205 pH meter and Minolta CR-300 colorimeter, respectively. Data were evaluated by means of one-factor analysis of variance with the SPSS 10.0 software package.

RESULTS AND CONCLUSIONS – The 7 and 10 week old PM and WM rabbits' body weight was significantly higher compared to the DL group. At the age of 11 weeks significant differences were only found between the PM and DL groups. 12 week old rabbits showed no significant differences among the groups (Table 1). For the whole growing period (5-12 wk), the average daily gain of the PM and DL rabbits was significantly different while the results of the WM group was intermediate compared to these groups. No significant differences were found for mortality, feed consumption and feed conversion ratio (Table 2).

Table 1 – Effect of floor type on the body weight of growing rabbits

Age, weeks	Groups			SE	Prob.
	Wire mesh	Plastic mesh	Deep litter		
5	965	967	965	5.458	0.979
7	1630 ^b	1662 ^b	1545 ^a	12.34	<0.001
10	2333 ^b	2360 ^b	2216 ^a	19.25	0.005
11	2572 ^{ab}	2601 ^b	2474 ^a	20.69	0.031
12	2732	2770	2674	19.88	0.143

^{a,b} means within a row followed by different superscript letters differ significantly ($P \leq 0.05$).

Table 2 – Effect of floor type on the performance of growing rabbits between ages of 5 and 12 weeks

Traits	Groups			SE	Prob.
	Wire mesh	Plastic mesh	Deep litter		
Body weight gain, g/d	35.5 ^{ab}	36.6 ^b	34.3 ^a	0.362	0.040
Feed intake, g/d	127	129	118	2.951	0.290
Feed conversion ratio	3.77	3.74	3.52	0.144	0.733
Mortality, %	4.5	6.7	8.7		0.733

^{a,b} means within a row followed by different superscript letters differ significantly ($P \leq 0.05$).

Similarly to our findings, Dal Bosco *et al.* (2002) observed that housing the rabbits on deep litter negatively affected the body weight, body weight gain and feed consumption. Although DL rabbits showed the highest mortality rates, the differences were not significant among the groups (Table 2). Dal Bosco *et al.* (2002) also recorded slightly increased mortality of rabbits housed on deep litter.

As the rabbits were slaughtered at the same body weight, no differences were observed among the groups for body weight at slaughter, hot and chilled carcass weight, reference carcass weight and ratios of the fore and mid parts to the reference carcass. On the contrary, significant differences were recorded between the PM and DL groups for dressing out percentage, ratio of mid part to the reference carcass and for the b* value. Compared to the PM and DL groups, the performances of the WM rabbits were intermediate (Table 3). Dal Bosco *et al.* (2002) reported similar results. For the other carcass and meat quality traits, no differences were detected among the groups. Based on our findings it could be concluded that housing the growing rabbits on wire or plastic mesh floors had no substantial differences on the rabbits' production, slaughter performance and meat quality. Housing the rabbits on deep litter negatively affected certain traits but the alterations were smaller compared to the results of the relevant literature.

Table 3 – Effect of floor type on the carcass and meat quality traits of growing rabbits

	Groups			SE	Prob.
	Wire mesh	Plastic mesh	Deep litter		
Slaughter weight (SW), g	2765	2731	2696	19.72	0.358
Chilled carcass yield, % SW	59.0 ^{ab}	59.7 ^b	58.7 ^a	0.153	0.038
Fore part, % RC	31.1	31.2	30.7	0.101	0.064
Mid part, % RC	29.8	30.2	29.9	0.107	0.243
Hind part, % RC	37.3 ^{ab}	36.8 ^a	37.6 ^b	0.109	0.010
Hindleg meat/bone ratio	4.06	3.98	3.99	0.028	0.420
Colour of MLD:					
L* value	59.9	61.0	59.7	0.422	0.446
a* value	3.36	4.12	3.72	0.165	0.172
b* value	2.45 ^{ab}	3.14 ^b	2.18 ^a	0.138	0.011
pH _u of <i>biceps femoris</i>	5.90	5.91	5.97	0.021	0.304
pH _u of <i>longissimus dorsi</i>	5.64	5.70	5.61	0.019	0.162

^{ab} means within a row followed by different superscript letters differ significantly ($P \leq 0.05$).

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